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ENVIRONMENTAL DEFENSE

finding the ways that work

May 8, 2008

To: U. S. Fish and Wildlife Service
Larry Crist, ES Utah Field Supervisor
2369 West Orton Circle,
West Valley City, UT 84119

Re: FWS Agreement No.: 1448-60181-05-G134 (Utah Prairie Dog Recovery – Allen Henrie Ranch) – Annual Progress Report (2007)

Dear Mr. Crist,

Please accept this letter and attached report as part of the reporting requirements for the above referenced Private Stewardship Grant. We have completed the third year's work for this project. Progress on the project is proceeding as scheduled. Please see the attached report and photos for details.

In summary, our work for 2007 describes changes in vegetation following initial treatment of the Allen Henrie property to improve conditions for re-entry of Utah prairie dogs to the study site. This report describes the status of the plant composition following two seasons of treatments to remove rubber rabbitbrush and improve the understory composition from sites that supported a mixture of introduced perennial pasture grasses. It goes on to describe the plant composition among treatments as recorded from field inventories conducted in 2007. The report specifically addresses the success of different control measures to eliminate the shrub cover and improve the composition of herbaceous species.

We are happy to say that the landowner, Mr. Henrie is still pleased with the project, and continues to be an important spokesperson in support of Safe Harbor agreements and participates in ongoing work surrounding the recovery of the Utah prairie dog as well as the Southwest willow flycatcher.

Thank you very much for your support of our work and please contact me with any questions.

Sincerely,

Theodore P. Toombs
Ecologist/Policy Analyst

Rocky Mountain Office · 2334 North Broadway · Boulder, CO 80304 · Tel 303 440 4901 · Fax 303 440 8052 · www.environmentaldefense.org
National headquarters: New York Austin · Boston · Los Angeles · Raleigh · Sacramento · San Francisco · Washington *Project offices:* Beijing, China · Bentonville, AR

Progress Report - 2007

Utah Prairie Dog Habitat Improvement Project
Allen Henry Property

Completed
December 29, 2007

Stephen B. Monsen

Progress Report
Utah Prairie Habitat Improvement Project
Allen Henry Property
December 21, 2007

INTRODUCTION

This report describes changes in vegetation following initial treatment of the Allan Henry property to improve conditions for reentry of Utah prairie dogs to the study site. The study and treatments were initiated in 2005 as a cooperative project with the land owner, Environmental Defense, Utah Division of Wildlife (DWR), Natural Resource Conservation Service (NRCS), and US Fish and Wildlife Service (USFWS). This report describes the status of the plant composition following two seasons after treatments to remove rubber rabbitbrush *Chrysothamnus nauseosus* and improve the understory composition from sites that supported a mixture of introduced perennial pasture grasses. Various treatments were employed to eliminate the shrub overstory and reduce the grass understory to interseed a mixture of broadleaf herbs and native grasses. Control measures were completed in the summer of 2005 and the sites were seeded in the fall of 2005. Permanent study plots were established throughout the site prior to treatment. Areas were re-inventoried in 2006 to evaluate the initial effects of different plant control measures and determine the success of the seeding practices. Progress reports were prepared and submitted for review of activities completed in 2005 and 2006. This report describes the plant composition among treatments as recorded from field inventories conducted in 2007. The report specifically addresses the success of different control measures to eliminate the shrub cover and improve the composition of herbaceous species.

SITE DESCRIPTION AND CHARACTERIZATIONS

Some information presented in the earlier reports is included in this document to better understand the treatments employed and response of the vegetation. The study site is located about 10 miles south and west of Panguitch, UT. The property boarders the Dixie National Forest at an elevation of approximately 7,000 feet. The area receives between 14 to 18 inches of annual moisture, principally as winter storms. The treated area occupies approximately 60 acres and is located in a small valley bottom with relatively deep soils that would naturally support a mountain big sagebrush *Artemisia tridentata spp. vaseyana* association. A narrow, semi-wet, ephemeral corridor extends through the site and supports a remnant of Carex, jointed rush *Juncus balticus*, some rhizomatous grasses, and rubber rabbitbrush (fig. 1.). A major portion of the proposed site has previously been plowed and seeded to a mixture of forage grasses (table 1.). The principal seeded grasses include fairway crested wheatgrass *Agropyron cristatum*, intermediate wheatgrass *Thinopyrum intermedium*,

Russian wildrye *Elymus junceus*, and limited amounts of smooth brome *Bromus inermus*. Scattered amounts of perennial native grasses including bottlebrush squirreltail *Elymus elymoides,* western wheatgrass *Pascopyrum smithii*, and Basin wildrye *Elymus cinereus* also occur in the area. Few native forbs exist in understory and are widely scattered. None have increased in importance during the past two seasons since livestock have been excluded from the area.

Approximately 4,350 mature rubber rabbitbrush plants occurred per acre on the study site prior to treatment. Mature bushes were tall with an average height of approximately 28 inches. Nearly all plants produced abundant flowers and mature seeds each year (fig. 1). Only a scattered number of mountain big sagebrush or other shrubs occurred on the site. Previous tillage and farming practices removed most other shrubs. Rubber rabbitbrush plants have been able to invade the grass seeding a number of years ago and have persisted with current grazing practices. Although rubber rabbitbrush is naturally occurring in the surrounding communities, it dominates the study site due to the grazing pressure the site receives. A relatively good stand of seeded grasses exist in the understory, but they are quite heavily grazed each year.

Table 1- Percent ground cover of understory and woody plants at the Allen Henry study site prior to treatment.

	Principal Plant Types				
Transect Number	Bunch Grasses	Rhizomatous Grasses	Broadleaf Herbs	Rabbitbrush	Big Sagebrush
		-Per Cent Ground Cover-			
1	5 .0	5.0		29.8	5.0
2	5.5	3.0		20.0	9.0
3	5.0	5.0	5.0	24.6	2.0
4	2.5	6.0		28.8	1.0
5	6.0	6.0		31.0	
6	6.0	5.0	5.0	10.0	5.0
7	18.0	5.5	5.0	20.9	
8	13.0	10.0		18.1	
9	10.0	1.0		12.5	8.0
10	10.0	5.0		23.3	
Mean	8.1	5.1	1.5	23.5	3.0

Figure 1. -Dense and mature plants of rubber rabbitbrush occupied the study site prior to treatment

TREATMENT PRACTICES

Control of Rabbitbrush and Associated Vegetation

Removal of rubber rabbitbrush and other shrubs was considered necessary to restore habitat for Utah prairie dogs. Different measures were considered necessary to remove the plants as numerous studies have reported this shrub is difficult to control. Previous studies by other investigators have found that individual plants are able to recover from mechanical clipping and most herbicide treatments. Plants are capable of resprouting from both the stem and root segments. . Based on existing information a series of control measures was proposed. We elected to utilize a combination of both mechanical and chemical herbicides applied at specific periods. This included mechanical mowing in the late spring followed by the application of two different herbicide treatments.

The entire 60 acre tract was mowed the last week of May 2005 using a tractor drawn rotary mower capable of mowing and shredding woody vegetation. All existing shrubs were clipped or mowed to a height of approximately 6 inches. Between two and three weeks after the site was mowed the entire area was marked off in parallel strips aligned in a north-south direction. A contact herbicide "Roundup" was applied in strips that were 28 feet wide and extended through the length of the property. An area 56 feet wide was skipped or not sprayed and lay parallel to the sprayed strip

(fig. 2). The entire 60 acres was treated with the contact herbicide in this alternating pattern. A total of 30 alternating strips were sprayed throughout the area. Concentrated Roundup was applied at a rate of 44 oz (2 quarts) per acre. In addition "Quest" (NH3) was added at a rate of 1.5 quarts per 100 gallons of fluid as a means to increase the effectiveness of the herbicide. The herbicide and carrier were mixed with water and applied at a rate of approximately 15 gallons of fluid per acre. The herbicide was applied using a tractor drawn sprayer with extended booms.

The herbicide was applied on June 10, 2005 as the shrubs had been able to resprout following mowing. At this date, numerous new stems had formed from the short stems that remained after mowing. The new stems were allowed to grow to lengths between 7 to 12 inches. Mowing was completed at a time the shrubs had completed the maximum vegetative growth in the early summer. The follow up application of Roundup herbicide was completed after the shrubs had expended considerable reserves to from a second amount of tissue.

A second herbicide was applied to the entire 60 acres on August 5, 2005 to aid in the removal of rubber rabbitbrush. A mixture of broadleaf herbicides was applied to both areas or strips that were previously sprayed or not sprayed with Roundup. The combined broadleaf herbicides were mixed and applied using a tractor mounted spray unit. The broadleaf herbicides were applied at this date as new shoots had reformed on the rubber rabbitbrush plants within the strips that survived mowing and treatment with Roundup. Adequate soil moisture still remained to support plant regrowth and maximize the effectiveness of the herbicide treatment. The combined broadleaf herbicides applied included:

Formula (per acre) mixture
One (1) quart Clarity – 1 lb. active ingredient
Two (2) quarts Grazon – 1 lb. 2, 4-D Active ingredient
.27 lb active ingredient Pickloram (Tordon)
Two (2) quarts 2,4-D Low volatile ester, 1.9 lbs active ingredient
One (1) quart Activator 90/100 gallons water
One (1) quart Hi-light (blue)/ 105 gallons water

The strips that were mowed, sprayed with Roundup, and over-sprayed with broadleaf herbicides created areas that were free of existing plants and could be seeded with a more desirable combination of species for prairie dogs. The alternating strips that were mowed and only sprayed with a broadleaf herbicide retained the existing seeded grass cover but were void of shrubs. The combined sites were felt to be conducive to prairie digs but did not require complete elimination of existing cover. These sites not only furnished considerable ground cover and habitat to prairie dogs but remained an important source as forage for livestock.

Figure 2. Alternating pattern of Roundup sprayed and non-sprayed strips. Roundup herbicide was applied in the darken strips resulting in the death of most understory species. A combination of broadleaf herbicides was applied to the entire area to control rabbitbrush.

Project Seeding

The individual strips that had been mowed, sprayed with Roundup, and over-sprayed with a combination of broadleaf herbicides were seeded on November 15, 2005 to a mixture of perennial native grasses and broadleaf herbs (table 2. The alternating strips that were mowed and sprayed with a broadleaf herbicide but not sprayed with Roundup still supported a perennial grass understory. These strips were not seeded due to the competition provided by existing mature plants. The plants selected for seeding were site adapted and considered better suited to furnish structural cover and forage for Utah prairie dogs.

Table 2. - Species planted at the Allen Henry property on November 15, 2005.

Species planted	Seeding Rate Lb/ac	Purity/germination Per Cent		Number Seeds/lb
Grasses				
Blue grama	1.0	80	80	825,000
Brome, mountain	2.0	95	90	90,000
Ricegrass, Indian	1.0	96	80	630,000
Squirreltail, bottlebrush	1.0	82	85	192,000
Wheatgrass, slender	3.0	96	95	159,000
Wheatgrass, streambank	2.0	96	90	156,000
Wheatgrass, thickspike	1.0	96	93	154,000
Wheatgrass, western	2.0	95	85	110,000
Forbs				
Aster, Pacific	1.0	20	85	2,680,000
Flax, blue	1.0	98	97	293,000
Globemallow, Scarlet	1.0	80	74	500,000
Lupine, silky	1.0	98	87	12,900
Penstemon, Wasatch	1.0	96	90	550,000
Sweetvetch, Utah	1.0	90	87	33,600
Total lbs./acre	18.0			

SAMPLING METHODS

Data Collection

Prior to treatment, permanent transects were randomly established throughout the area to inventory the woody and herbaceous vegetation. Following the application of Roundup herbicide a second set of transects were permanently established. The second set of transects consisted of ten transects that were established randomly among the strips that were sprayed with Roundup herbicide. Ten additional transects were established in adjacent strips that were mowed and only sprayed with a broadleaf herbicide. All transects were 100 ft in length and permanently staked with wooden lath. The transects served as areas for sampling vegetation at the end of each growing season in 2005, 2006, and 2007. At each sampling date all shrubs that occurred within a 5 ft strip along the entire length of each transect were recorded by age class, as live or dead plants, and the maximum heights and crowns were measured and recorded. Within each transect, ten meter square subplots were also randomly established. Within each subplot, the percent ground cover of all herbaceous species was recorded by individual species. Photographs were taken of representative sites and conditions at all sampling dates.

RESULTS

Mowing and Herbicide Treatments

Nearly all rubber rabbitbrush shrubs recovered following early summer (May 20th) mowing regardless of the age of the plant. All rubber rabbitbrush plants had begun growth and had developed shoots or stems that were 7 to 12 inches in length prior to mowing. Mowing rubber rabbitbrush plants at this stage of growth promoted immediate regrowth. Stem elongation began within 1 to 2 weeks after treatment (fig. 3). Considerable soil moisture remained to support new growth and plants remained quite healthy and vigorous. In contrast with rubber rabbitbrush, all mature mountain big sagebrush plants were killed by mowing. Only small plants that were less than 6 inches in height survived.

Figure 3. New stem growth of rubber rabbitbrush about one month after mowing and spraying with Roundup herbicide. Plants at this stage of regrowth were treated with a combination of broadleaf herbicides.

Roundup herbicide was applied at a time when conditions were most effective in killing all vegetation. All plants were actively growing, the air temperature was moderately high, and sufficient soil moisture existed to sustain growth. With the exception of rubber rabbitbrush, the herbicide treatment was effective in killing nearly all existing species (fig. 4). The leaves and stems of most all rubber rabbitbrush plants were killed rather quickly. Within 2 to 3 weeks after treatment, new shoots began to appear on most rabbitbrush plants. The treated and non-treated areas or strips were re-inventoried on July 13, 2005; approximately one month after the sprayed had been applied (table 3). At this date, the percent mortality of rubber rabbitbrush was quite erratic and ranged from 0 to 95 percent. Considerable differences were also noted of the vigor or health among the individual plants. All plants that were treated with Roundup were also sprayed with a combination of broadleaf herbicides, consequently no sites were left to compare the long-term effects of only spraying with Roundup. However, a considerable number of shrubs were able to resprout following mowing and the application of Roundup, indicating that these treatments alone would not be sufficient to eliminate this woody species. Nearly all small or young sagebrush plants that survived mowing were killed by the herbicides.

Table 3. – Percent mortality of herbaceous and woody species one month after application of Roundup herbicide and spring mowing.

Transect Number	Bunch Grasses	Rhizomatous Grasses	Forbs	Big Sagebrush	Rabbitbrush
	Per Cent of Dead Plants				
1	95	10	100	100	0
2	100	10			95
3		100			10
4	100				0
5	95				10
6	100			100	0
7		95		10	0
8	100				0
9	100			80	0
10	100				30

Figure 4. Treated areas at the end of the growing season, 2005. Barren strip were sprayed with Roundup herbicide to eliminate herbaceous grasses and forbs.

The broadleaf herbicide treatment had an immediate effect on rubber rabbitbrush plants and understory broadleaf herbs. All vegetative tissue of both rubber rabbitbrush and all forbs withered and appeared to die within a week following treatment. No regrowth was detected during the remaining summer or fall months in 2005 even though sufficient soil moisture was available to support regrowth. Areas sprayed and non-spayed with broadleaf herbicides were inventoried in August 2006 and October 29, 2007. The effects of all treatments as recorded in August 2006 are presented in (table 4).

Table 4—Response of rubber rabbitbrush and big sagebrush plants on August 20, 2006 after two growing seasons following mowing and herbicide treatments.

	Rubber Rabbitbrush				Big Sagebrush			
	Number Alive		Number Dead		Number Alive		Number Dead	
Transect	Mow + Roundup	Mow + Roundup + Broadleaf Herbicides	Mow + Roundup	Mow + Roundup + Broadleaf Herbicides	Mow + Roundup	Mow+ Roundup+ Broadleaf Herbicides	Mow + Roundup	Mow+ Roundup+ Broadleaf Herbicides
1.	9	0	15	11	0	0	1	2
2.	7	0	36	36	0	0	1	6
3.	3	0	23	12	0	0	2	1
4.	4	0	35	10	0	0	2	0
5.	3	0	27	7	0	0	3	3
6.	9	0	32	19	5	0	0	0
7.	9	0	44	0	0	0	3	3
8.	2	2	18	8	0	0	2	2
9.	1	1	19	10	0	0	2	2
10.	4	4	24	17	0	0	0	0

Rubber rabbitbrush plants demonstrated the unusual ability to recover and resprout following mowing and spraying with Roundup herbicide. However, an additional application of broadleaf herbicides resulted in a killed of 89.8 per cent of all plants by mid summer 2006 (table 5). By 2007, additional plants had succumbed and a more uniform kill was apparent. New seedlings of rubber rabbitbrush established in 2007 in both the Roundup/broadleaf herbicide treated strips and in strips treated only with the broadleaf herbicide. This resulted in an overall increase in the number of plants from 2006 to 2007 (table 5). The site supported approximately 4,356 rubber rabbitbrush plants in 2005 prior to treatment. The number diminished significantly to 30 plants per acre in 2006 in the strips receiving both Roundup and broadleaf herbicides. By 2007, the number increased to 552 plants per acre. By contrast, the number of rabbitbrush plants recorded in 2006 in the areas receiving only the broadleaf herbicide was 222 plants per acre, and by 2007 the number had increased to 396 plants per acre. It is apparent that the application of both herbicides contributed to a substantial decline in shrubs in 2006, but also created more open or bare ground which allowed for shrub seedlings to establish in 2007. Considerable seed of rubber rabbitbrush is blown onto the treated sites from mature bushes that are located adjacent to the clearings. New rabbitbrush seedlings will continue to invade until the openings are occupied with a more complete and competitive cover. Spot treatments or sprays can be used to control the establishment of new shrub seedlings..

Table 5. - Average number of rubber rabbitbrush and big sagebrush plants per acre for different herbicide treatments from 2005 to 2007.

	Number of Plants Per Acre			
	No. Live Rabbitbrush Plants		No. Live Big sagebrush Plants	
	Mowed + Roundup	Mowed + Roundup Broadleaf herbicide	Mowed+ Roundup	Mowed +Roundup Broadleaf herbicide
2005	4,356	4,356	435	435
2006	222	30	21	21
2007	396	552	39	56

Mowing and two stages of herbicide treatment were effective in removing the mature plants of rubber rabbitbrush. The dates and time intervals between mowing and the application of both herbicides were quite effective in the removal of rubber rabbitbrush and associated species. The few individual rabbitbrush plants that were able to survive both herbicide treatments did not appear to be adequately treated. Applying the herbicide uniformly and completely to each individual bush and all foliage was difficult. Stems and leaves that were not spayed appeared able to recover. A more complete kill could be expected with repeated and more complete applications of the broadleaf herbicides. Scheduling the intervals between mowing and application of the herbicides was essential to stress the plants and allow new stems time to form. Sufficient time was necessary to allow the shrubs to recover and develop new stems and leaves. Applying the herbicide on new and active tissue or stems resulted in immediate uptake of the herbicides. Mowing tended to stress the plant and applying the herbicides to rapidly growing vegetation resulted in translocation of the herbicides to the roots. Resprouting from the roots was not recorded from either mowing or herbicide applications. All new growth occurred from existing stems that were one or two year old wood. Follow-up treatments will be necessary to prevent new seedlings from establishing on the site. As mentioned, this could be completed with selective or spot spraying.

The combination of mowing and Roundup herbicide treatments appeared to eliminated or kill nearly all understory grasses and incidental broadleaf forbs within one or two months after treatment in 2005. Prior to initial treatments, the average ground cover of all perennial bunchgrasses was 8.1 per cent. Rhizomatous grasses and Carex combined to furnish 5.1 per cent ground cover. Although a considerable number grasses were killed not all were eliminated. The overstory shrubs intercepted the herbicide and not all grasses received the sprays. In addition, the removal of the shrub overstory has allowed the grasses to regroup and increase in size and area of occupation. By 2006, the bunchgrass cover in the Roundup treated strips was 5.2 per cent and by 2007 the figure had

increased to 10.4 per cent (table 6). The increase in ground cover occurred as plants that initially died back were able to quickly recover. The seeded grasses also furnished considerable cover by 2007. At this date the ground cover of seeded species was 12.7 per cent.

Strips not treated with the contact herbicide but sprayed with the broadleaf herbicide have also shown a significant increase in perennial grass cover. Per cent bunchgrass cover prior to treatment in 2005 was 8.1 per cent. By 2006, the perennial bunchgrass cover responded dramatically and increased to 36.4 per cent. By 2007, the combined perennial grass cover increased to 41.9 per cent.

Table 6.—Per cent ground cover for all classes of plants of sites mowed and sprayed with broadleaf herbicide with and without application of Roundup herbicide during 2005, 2006 and 2007.

	Major Classes of Plants						
	Bunchgrasses	Rhizomatous Grasses	Native Forbs	Seeded Grasses	Seeded Forbs	Rabbitbrush	Big Sagebrush
	Per Cent Ground Cover						
Non Roundup							
2005	8.1	5.1	1.5			23.5	3.0
2006	36.4	6.6	0			6.8	0.2
2007	41.9	1.2	0			1.5	0.3
Roundup Treated							
2005	8.1	T				23.5	3.0
2006	5.2	0.4	3.0	T	T	1.1	0
2007	10.4	0.8	0.6	12.7	1.4	1.1	1.6

Plants of Russian wildrye have been able to recover rapidly within the strips or areas sprayed with Roundup (fig. 5). Although plants of Fairway crested wheatgrass have also survived and responded, Russian wildrye is most prevalent. Although the perennial grass cover has continued to increase the sites still support considerable open or bare ground. The establishment of new seedlings of the seeded species has not been seriously affected by existing plant competition.

A natural increase in species composition is occurring in all open areas. A significant number of new seedlings and young plants of broom snakeweed *Gutierrezia sarothrae*, fringed

sagebrush *Artemisia frigida* , and a number of annual or perennial weeds were encountered in 2007. These and other pioneering species can be expected to occur as the sites stabilize.

Figure 5. - Russian wildrye plants have been able to recover and attain considerable growth two years after herbicide treatment.

Nearly all perennial forbs were killed by the herbicide treatments. Individual plants of silky lupine (*Lupinus sericeus*) persisted but only a few individuals of any other broadleaf herb occur in sufficient amounts to be of any importance (fig 6).

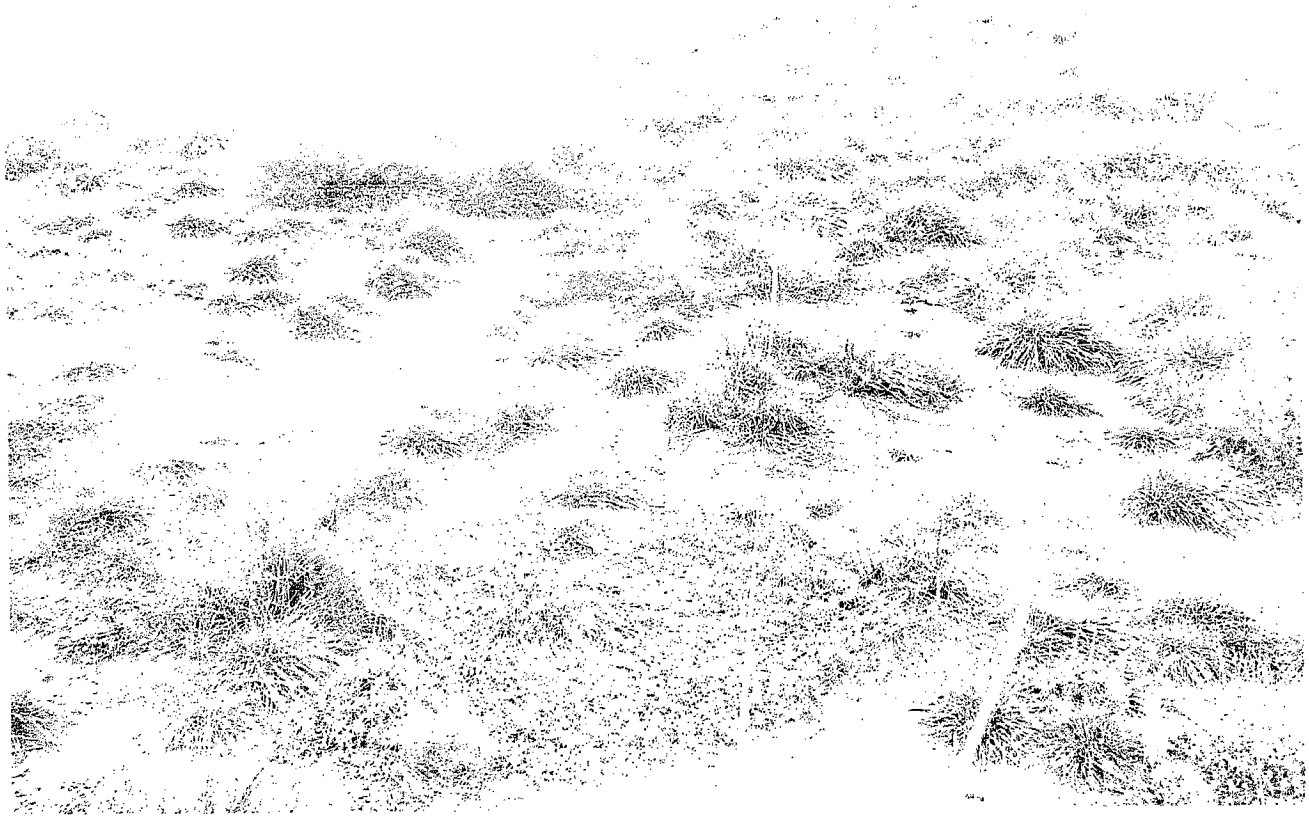

Figure 6.- A mixture of plants currently occupy the sites that were cleared and seeded. A number of perennial grasses survived the mowing and herbicide treatments, and different seeded grasses, seeded forbs, and some invading plants now occupy the sites.

The soil surface was friable and moist at the time of planting and seeds could be properly placed at the desired depth (fig. 7). The soil and air temperatures remained low following planting, and no seeds germinated in the fall after the seeding. Most seeds germinated in the spring of 2006, but little or no moisture was received at the site throughout the following summer months. No appreciable rain was recorded until mid August. A fair stand of seeded grasses were able established and were recorded from sampling completed on August 24, 2007 (table 6). Prior to this date, the percent ground cover was obviously quite low. Individual plants occurred in a spotty pattern, indicating seedlings likely emerged but many failed to persist (fig. 8). Few seeded forbs became established from the fall 2005 seeding. No single species appeared more frequently than others except blue flax (*Linum lewisii*) which was slightly more common. A few plants of nearly every seeded forb were recorded, indicating that some germination and emergence occurred. The long dry period in the summer likely resulted in the death of the small seedlings.

A significant increase in jackrabbit population has occurred, and was particularly evident during the summer of 2007. These animals have increased in numbers and occupy the surrounding

areas. Selective grazing by rabbits is evident and has damaged a number of plants, particularly most seeded forbs. Some attempt should be employed to reduce the rabbit population and prevent concentrated damage.

Figure 7. Drill seeding a mixture of perennial grasses and broadleaf herbs. Soils did not require tillage prior to planting.

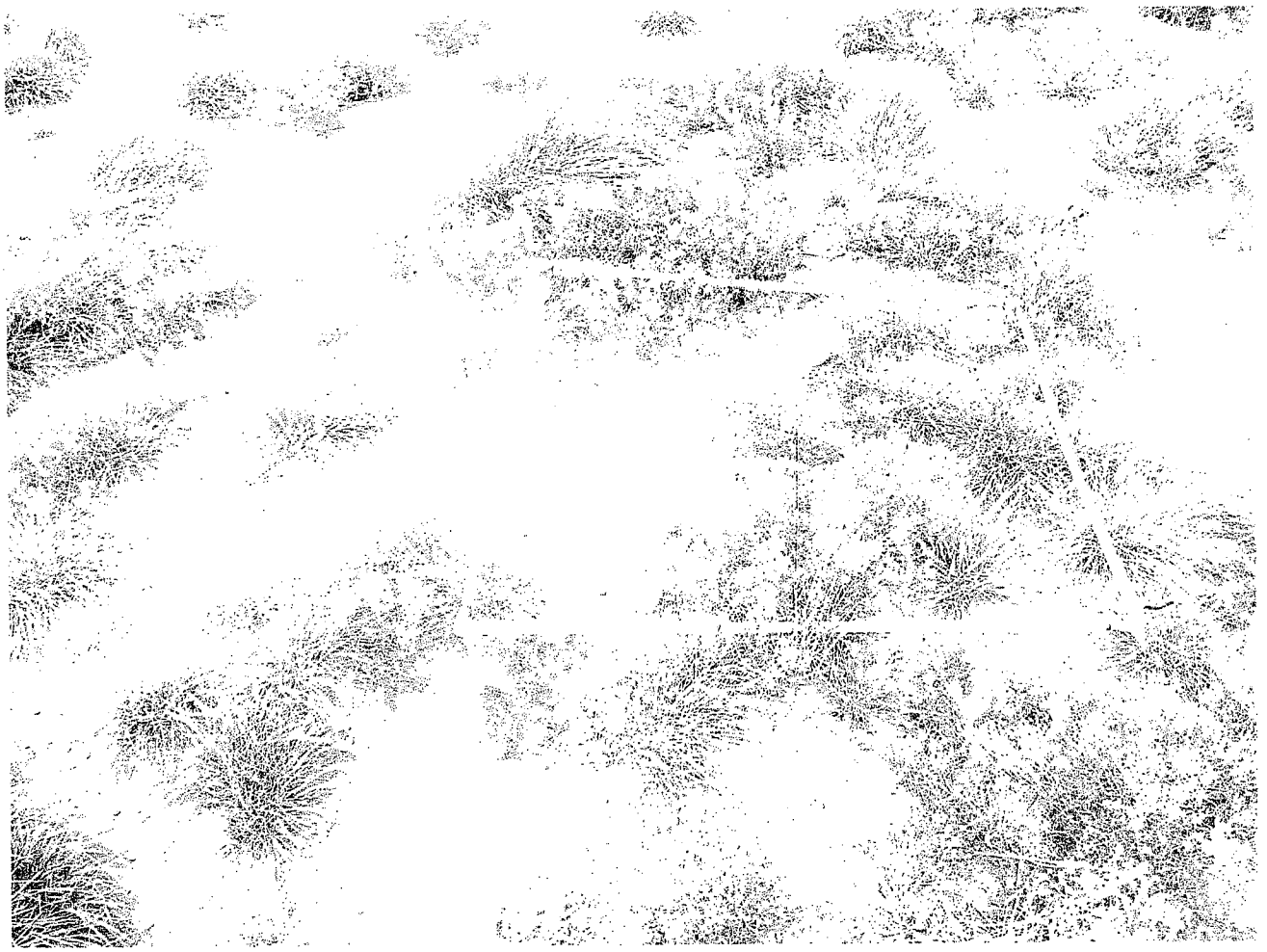

Figure 8. The new seedings are now being invaded by a series of pioneering species including broom snakeweed, fringed sagebrush and different annual forbs.

Summary

Creating strips or clearings in the existing vegetation was an effective and practical means of interseeding addition species into the area without complete removal of all existing vegetation. The application of Roundup herbicide removed most herbaceous plants and provided a seedbed free of competition. The amount of litter left on the soil surface from areas that were sprayed provided protectio to the soil surface and improving seedbed conditions. The soil surface was friable and suitable for direct seeding. Lack of summer moisture following the seeding resulted in only a fair stand of seeded grasses and a poor and spotty stand of broadleaf forbs.

The spray treatments used to reduce the woody shrubs and understory species were effective in reducing shrub overstory and herbaceous competition. Understory grasses recovered and increased naturally and quite rapidly as the shrub overstory was removed. The combined treatments including mowing and spraying of herbicides to control rubber rabbitbrush were effective in killing nearly all

shrubs. A few rubber rabbitbrush plants have re-sprouted, and a number of new seedlings established in 2007. The young plants occur in open areas or clearings. Rabbitbrush seed continues to drift into the clearings from mature bushes that occur adjacent to the sites. New sagebrush plants have also establishe by natural seeding and new plants of broom snakeweed, fringed sagebrush, and a few pioneering broadle herbs are also invading the openings. The increase in species composition is to be expected and additiona entry of new species will continue to occur. Rabbitbrush plants can become a problem unless control measures are used to remove the new seedlings. Few other troublesome weeds have occurred.

Sufficient forage now occurs to support some livestock grazing. Both the seeded species and the existing plants are now healthy enough to sustain some seasonal grazing. The number of broadleaf forbs relatively low and grazing by livestock and rabbits is a concern. The existing forbs will likely be selectively grazed even with low stocking rates. Rabbits are currently using the forbs at all seasons, and this should not be allowed to continue.